

## ABSTRACT

*Growth of technology in this time expand very fast and provide data service and voice having the character of real-time and also do not. Transfer of the voice and data automatically require transmission two direction . One of network which can be used for the transfer of that information is network of Hybrid Fiber Coax (HFC). The frequency 5-42 MHz is allocated for the signal of upstream and the frequency 50-870 MHz is allocated for the signal of downstream. Problem of which often happened to in upstream signal, because at direction of upstream big possibility will arise content of noise high level which because of narrowband ingress noise , impulse noise and microreflections that causing the existence of phenomenon of multipath at transmission channel of coaxial. With existence of noise-noise, can be ascertained that delivered data will be accepted in a state of destroying. Therefore required a way to handle the problems.*

*This Final project make simulation use matlab 7.1 and analyse performance of BER to SNR and throughput at upstream direction by using Reed-Solomon codes and M-Ary QAM that most appropriate by following standard of DOCSIS 2.0 and overcoming it at HFC network.*

*From result of the simulation, we get conclusion that by using code of RS(30,16), error that happened can correct more better than using the RS(255,223), and the using of most appropriate M-Ary QAM, will be get the efficient of transmit power and the efficient of bandwidth usage. So we will get the result of BER to SNR and throughput that wanted.*

**Key Words** : HFC, DOCSIS, Reed-Solomon.